CLAIMS

1. A method for satellite positioning system (SPS) signal processing, said method comprising:

receiving at an SPS receiver one or more SPS signals;

removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal;

combining said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said first portion and said second portion contain common information in said one or more SPS signals.

2. The method of claim 1, wherein said combining of said first portion with said second portion follows a differential demodulation of said one or more SPS signals.

3. The method of claim 2, wherein said combining of said first portion with said second portion includes summing said first and second portions following said differential demodulation.

4. The method of claim 2 wherein said differential demodulation combines pairs of signal samples contained with said one or more SPS signals which are separated in time from one another by a multiple of a bit period of data contained within said one or more SPS signals.

5. The method of claim 1, further comprising:

determining data bits representative of navigational information embedded in one of said first and said second portions from said combining.

6. The method of claim 5, wherein said navigational information comprises satellite ephemeris information and wherein said common information comprises identical information in said first and said second portions.

7. The method of claim 5, wherein said navigational information comprises error correction information.

8. The method of claim 5, wherein said navigational information comprises a position of said SPS receiver.

9. The method of claim 5, wherein said navigational information comprises a position of an entity.

10. The method of claim 1, wherein said SPS receiver comprises a Global Positioning Satellite (GPS) receiver.

11. The method of claim 10, wherein said mobile GPS receiver comprises communication circuitry.

12. The method of claim 1, wherein said first and second portions are separated in time by a duration equal to a multiple of a frame period of an SPS message.

13. The method of claim 1, wherein said first portion is associated with a first satellite vehicle message, and said second portion is associated with a second satellite vehicle message.

14. The method of claim 1, wherein said first and second portions are associated with exactly one satellite vehicle message.

15. The method of claim 1, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

16. A method for processing a signal associated with a satellite positioning system, said method comprising:

receiving at an SPS receiver a first SPS signal containing a satellite message associated with a satellite vehicle;

receiving at said SPS receiver a second SPS signal containing said satellite message associated with said satellite vehicle;

removing pseudorandom noise from said first and second SPS signals to provide a first set of signal samples of a narrowband signal and a second set of signal samples of a narrowband signal;

combining said first and second sets of signal samples to improve the sensitivity of the SPS receiver;

wherein said first set of signal samples and said second set of signal samples contain common information.

17. The method of claim 16, wherein said combining of said first and second sets of signal samples follows a differential demodulation of said first and second SPS signals.

18. The method of claim 17, wherein said combining of said first and second sets of signal samples includes summing said first and second sets of signal samples following said differential demodulation.

19. The method of claim 17, wherein said differential demodulation combines pairs of said first and second SPS signals separated in time from one another by a multiple of a bit period of data contained within said first and second SPS signals.

20. The method of claim 16, further comprising:

determining data bits representative of navigational information embedded in one of said first and said second sets from said combining.

21. The method of claim 20, wherein said navigational information comprises satellite ephemeris information.

22. The method of claim 20, wherein said navigational information comprises error correction information.

23. The method of claim 20, wherein said navigational information comprises a position of said SPS receiver.

24. The method of claim 20, wherein said navigational information comprises a position of an entity.

25. The method of claim 16, wherein said SPS receiver comprises a Global Positioning Satellite (GPS) receiver.

26. The method of claim 25, wherein said mobile GPS receiver comprises communication circuitry.

27. The method of claim 16, wherein said first and second sets of signal samples are separated in time by a multiple of the duration of the frames of said satellite message.

28. The method of claim 16, wherein said common information comprises a repetition of a portion of said satellite message.

29. A method for satellite positioning system signal processing, said method comprising:

receiving at an SPS receiver a first SPS signal containing a first satellite message, said first satellite message associated with a first satellite vehicle;

receiving at said SPS receiver a second SPS signal containing a second satellite message, said second satellite message associated with a second satellite vehicle;

removing pseudorandom noise from said first and second SPS signals to provide a first set of signal samples of a narrowband signal and a second set of signal samples of a narrowband signal;

combining said first and second sets of signal samples to improve the sensitivity of the SPS receiver;

wherein said first set of signal samples and said second set of signal samples contain common information.

30. The method of claim 29, wherein said combining of said first and second sets of signal samples follows a differential demodulation of said first and second SPS signals.

31. The method of claim 30, wherein said combining of said first and second sets of signal samples includes summing said first and second sets of signal samples following said differential demodulation.

32. The method of claim 30, wherein said combining of said first and second sets of signal samples includes a weighted summation of said first and second sets of signal samples, wherein weighting associated with said weighted summation depends on a signal-to-noise ratio (SNR) of at least one of said first and second sets of signal samples.

33. The method of claim 30, wherein said differential demodulation combines pairs of said first and second SPS signals separated in time from one another by a multiple of a bit period of data contained within said first and second SPS signals.

34. The method of claim 29, further comprising:

determining data bits representative of navigational information from said combining.

35. The method of claim 34, wherein said navigational information comprises satellite time-of-week (TOW) information.

36. The method of claim 34, wherein said navigational information comprises satellite Almanac information.

37. The method of claim 34, wherein said navigational information comprises a position of said SPS receiver.

38. The method of claim 34, wherein said navigational information comprises a position of an entity.

39. The method of claim 29, wherein said SPS receiver comprises a mobile Global Positioning Satellite (GPS) receiver.

40. The method of claim 39, wherein said mobile GPS receiver comprises communication circuitry.

41. The method of claim 27, wherein said first and second results comprise time-of-week (TOW) information.

42. The method of claim 41, wherein comparing said first and second results comprises determining a difference between TOW as indicated by said first and second results, and comparing said difference to a value representing a time difference between said first and second results.

43. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

a despreader that removes pseudorandom noise from one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal;

a processor, coupled to said despreader, to combine said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said first portion and said second portion contain common information.

44. The apparatus of claim 43, wherein said despreader comprises:

a differential demodulation unit to differentially demodulate said first and second portions; and

wherein said processor comprises

a summing unit, coupled to said differential demodulation unit, to sum said first and second portions.

45. The apparatus of claim 43, wherein said processor sums said first and second portions after said processor differentially demodulates said first and second portions.

46. The apparatus of claim 43, wherein said processor adds in a summing operation said first portion with said second portion following a differentially demodulating operation, and wherein said summing operation comprises including a weighting factor, said weighting factor being a function of a signal-to-noise ratio (SNR).

47. The apparatus of claim 43, wherein said apparatus comprises a mobile Global Positioning Satellite (GPS) receiver.

48. The apparatus of claim 47, wherein said mobile GPS receiver further comprises communication circuitry.

49. The apparatus of claim 43, wherein said first and second portions are separated in time by a duration equal to a multiple of a frame period of said satellite message.

50. The apparatus of claim 43, wherein said first portion is associated with a first satellite vehicle message, and said second portion is associated with a second satellite vehicle message.

51. The apparatus of claim 43, wherein said first and second portions are associated with exactly one satellite vehicle message.

52. The apparatus of claim 48, wherein a remote entity is accessible by said mobile GPS receiver via said communication circuitry.

53. The apparatus of claim 52, wherein said remote entity comprises a basestation.

54. The apparatus of claim 53, wherein said basestation comprises a communication link to a data processing network.

55. The apparatus of claim 43, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

56. The apparatus of claim 43, wherein said processor determines data bits representative of navigational information embedded in one of said first and said second portions from combining said first portion with said second portion.

57. The apparatus of claim 56, wherein said navigational information comprises satellite ephemeris information.

58. The apparatus of claim 56, wherein said navigational information comprises error correction information.

59. The apparatus of claim 56, wherein said navigational information comprises a position of an SPS receiver.

60. The apparatus of claim 56, wherein said navigational information comprises time-of-week (TOW) information.

61. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

means for removing pseudorandom noise from one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal; and

means for combining said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said first portion and said second portion contain common information.

62. The apparatus of claim 61, wherein said means for removing pseudorandom noise comprises:

a differential demodulation unit to differentially demodulate said first and second portions; and

wherein said means for combining comprises:

a summing unit, coupled to said differential demodulation unit, to sum said first and second portions.

63. The apparatus of claim 62, wherein said differential demodulation unit and said summing unit are included in a processor.

64. The apparatus of claim 61, wherein said means for combining adds in a summing operation said first portion with said second portion following a differentially demodulating operation, and wherein said summing operation comprises including a weighting factor, said weighting factor being a function of a signal-to-noise ratio (SNR).

65. The apparatus of claim 61, further comprising:

means for determining data bits representative of navigational information embedded in one of said first and said second portions from combining said first portion with said second portion.

66. The apparatus of claim 65, wherein said navigational information comprises at least one of:

a) satellite ephemeris information;

b) error correction information;

c) a position of an SPS receiver;

d) a position of an entity;

e) time-of-week (TOW) information; and

f) satellite Almanac information.

67. The apparatus of claim 61, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

68. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

a correlator, said correlator receiving one or more SPS signals; and

a navigation computer coupled to the correlator, said navigation computer removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal, said navigation computer combining said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said first portion and said second portion contain common information.

69. The apparatus of claim 68, wherein said navigation computer combines said first portion with said second portion follows a differential demodulation of said one or more SPS signals.

70. The apparatus of claim 68, wherein said navigation computer sums said first and second portions after said navigation computer differentially demodulates said first and second portions.

71. The apparatus of claim 68, wherein said navigation computer adds in a summing operation said first portion with said second portion following a differentially demodulating operation, and wherein said summing operation comprises including a weighting factor, said weighting factor being a function of a signal-to-noise ratio (SNR).

72. The apparatus of claim 68, wherein said navigation computer determines data bits representative of navigational information embedded in one of said first and said second portions from combining said first portion with said second portion.

73. The apparatus of claim 72, wherein said navigational information comprises at least one of:

a) satellite ephemeris information;

b) error correction information;

c) a position of an SPS receiver;

d) a position of an entity;

e) time-of-week (TOW) information; and

f) satellite Almanac information.

74. The apparatus of claim 68, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

75. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

means for receiving at an SPS receiver one or more SPS signals;

means for removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal;

means for combining said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said first portion and said second portion contain common information in said one or more SPS signals.

76. The apparatus of claim 75, wherein said means for combining combines said first portion with said second portion follows a differential demodulation of said one or more SPS signals.

77. The apparatus of claim 76, wherein said means for combining sums said first and second portions following said differential demodulation.

78. The apparatus of claim 76, wherein said differential demodulation combines pairs of signal samples contained with said one or more SPS signals which are separated in time from one another by a multiple of a bit period of data contained within said one or more SPS signals.

79. The apparatus of claim 75, further comprising:

means for determining data bits representative of navigational information embedded in one of said first and said second portions from said combining.

80. The apparatus of claim 79, wherein said navigational information comprises at least one of:

a) satellite ephemeris information;

b) error correction information;

c) a position of an SPS receiver;

d) a position of an entity;

e) time-of-week (TOW) information; and

f) satellite Almanac information.

81. The apparatus of claim 75, wherein said first and second portions are separated in time by a duration equal to a multiple of a frame period of an SPS message.

82. The apparatus of claim 75, wherein said first portion is associated with a first satellite vehicle, and said second portion is associated with a second satellite vehicle.

83. The apparatus of claim 75, wherein said first and second portions are associated with exactly one satellite vehicle message.

84. The apparatus of claim 75, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.